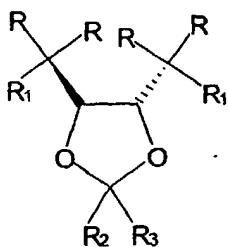


KD-01-004PCT

WHAT IS CLAIMED IS:

1. An optically active compound of the formula:



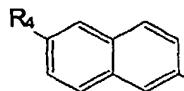
5

where the R₂ and R₃ groups are methyl, another lower alkyl group or an aryl or biaryl unit while the R₁ groups independently each are a hydroxyl, alkoxy, aryloxy, or arylalkoxy group, the R groups each represent a group as follows:

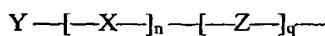


- 10 where A₁ is an aromatic group, an acyclic aliphatic group, or an alicyclic group, and A₁ can be a substituted or unsubstituted group, Z is a group selected from -O-, -OCO-, or -S-, and the coefficient q is 0 or 1. Z may also be (CH₂)_nO where the coefficient n is 0 to 5 and the coefficient q is 1. A₂ is a bivalent radical of a naphthalene group, and the cyclic structure of A₂, or A₁ if it is cyclic, optionally can be heterocyclic, such as by replacement of one or more
15 CH member(s) of the ring structure with N, O and/or S.

2. The optically active compound of claim 1, where each R substituent is independently selected as:



- 20 where R₄ represents a group as follows:



KD-01-004PCT

where n is an integer value of 0 or 1 or more, X is -CH=CH-CH₂- or -(CH₂)_m- where m is an integer value of 1, 2, 3, or more, Y is a radical of an aromatic hydrocarbon, an acyclic aliphatic hydrocarbon, or an alicyclic hydrocarbon, and Y can be a substituted or unsubstituted group, and Z and q have the same respective meanings as defined in claim 1.

5

3. The optically active compound of claim 2, where R₄ is an aryloxy radical, an arylalkoxy radical, an arylalkyleneoxy, or an arylalkenyleneoxy radical.

4. (4R,5R)-2,2-dimethyl- $\alpha,\alpha,\alpha',\alpha'$ -tetrakis[6-(benzyloxy)naphth-2-yl]-1,3-dioxolane-
10 4,5-dimethanol.

5. A liquid crystalline mixture, comprising:

a liquid-crystalline base having liquid crystalline properties;
at least one optically active compound of the formula as described in
15 any of one of claims 1-4.

6. The liquid crystalline mixture according to claim 5, further including an achiral non-liquid crystalline compound.

20 7. The liquid crystalline mixture according to claim 6, wherein the achiral non-liquid crystalline compound comprises R¹-C≡N, where R¹ represents an aliphatic group.

8. The liquid crystalline mixture according to claim 7, wherein R¹-C≡N comprises an alkynitrile.

25

9. The liquid crystalline mixture according to claim 7, wherein R¹-C≡N comprises undecanenitrile.

30 10. An electro-optical cell comprising a layer including a liquid crystalline mixture as described in any one of claims 5-9 sandwiched between two substrate means, and means for applying an electric potential to the substrate means.

KD-01-004PCT

11. A light modulating apparatus comprising an electro-optical cell according to
claim 10.
- 5 12. The light modulating apparatus according to claim 11, wherein the light
modulating apparatus comprises a cholesteric display.
13. An electro-optical cell comprising:
a layer comprising:
10 at least 70 weight percent (wt%) nematic host mixture; and
 at least about 2 wt% (4R,5R)-2,2-dimethyl- $\alpha,\alpha,\alpha',\alpha'$ -tetrakis[6-(benzyloxy)naphth-2-yl]-1,3-dioxolane-4,5-dimethanol;
 first and second substrates disposed above and below, respectively, the layer; and
 first and second conductors physically coupled to the first and second substrates,
15 respectively, which permit an electrical potential to be applied across the layer.
14. The electro-optical cell as recited in claim 13, wherein the layer further comprises
about 2-6 wt% achiral material.
- 20 15. The electro-optical cell as recited in claim 13, wherein the layer further comprises
a chiral material different from (4R,5R)-2,2-dimethyl- $\alpha,\alpha,\alpha',\alpha'$ -tetrakis[6-(benzyloxy)naphth-
2-yl]-1,3-dioxolane-4,5-dimethanol and having an opposite twist sense.
- 25 16. A light modulating apparatus comprising an electro-optical cell according to any
one of claims 13-15.
17. The light modulating apparatus according to claim 16, wherein the light-
modulating apparatus comprises a cholesteric display having a temperature independent
reflective wavelength.